

NOVEMBER/DECEMBER 2024

**23PMB31 — SOIL AND ENVIRONMENTAL
MICROBIOLOGY**

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Discuss the methods used to quantify soil microflora.
2. Define soil microbiology.
3. What is commensalism?
4. Differentiate between the types of mycorrhizae.
5. What is the sulfur cycle?
6. Define lithosphere.
7. Name the four types of solid waste.
8. Name two factors affecting solid waste generation rates.
9. How is 2, 4-D herbicide biodegraded in the environment?
10. List out the role of microorganisms in the degradation of cellulose.



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SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL the questions.

11. (a) Identify and describe the major groups of microorganisms found in soil.

Or

- (b) Discuss the role of microorganisms in soil fertility.

12. (a) Describe amensalism and its ecological significance.

Or

- (b) Explain the rhizosphere effect and its importance for plant health.

13. (a) Explain the atmosphere and its significance in the ecosystem.

Or

- (b) Outline the carbon cycle and its importance in the ecosystem.

14. (a) Discuss the various types of solid waste and their characteristics.

Or

- (b) Describe the impact of improper e-waste disposal on the environment.

15. (a) Explain the microbial mechanisms involved in the biodegradation of TNTs and PCBs.

Or

- (b) Discuss the environmental implications of the biodegradation of hydrocarbons.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Discuss the role of microorganisms in soil fertility and the mineralization of organic and inorganic matter.

17. Describe the characteristics and functions of plant growth-promoting rhizobacteria (PGPR).

18. Identify and explain the physical factors affecting the distribution of microorganisms in various environments.

19. Analyze the processes involved in solid waste management and the importance of each step.

20. Analyze the role of microorganisms in the degradation of lignin, cellulose, hemicellulose, and pectin in organic matter recycling.

